tion comparable to those on the ground, with possibly a moderate dependence upon observer motion. Plane-borne equipment near the tropopause, however, showed definite dependence upon either the observer's height or motion or both. A balloon flight in an open gondola to 41,000 feet, which is 5000 feet above the tropopause, was an attempt to vary only height of the observer, with his motion depending only upon ambient winds. The gondola rotation seriously exceeded expectations and the guiding capabilities of my equipment, but I noted with naked eye that no star higher than 3° above my tropopause-defined horizon showed any scintillation. Scintillation for higher stars appeared as the balloon was allowed to descend into the troposphere, affecting stars at uniformly increasing altitudes until, before the 20,000 foot level was reached, all stars appeared to twinkle in a manner essentially identical with that seen from the ground, except for an absence of color scintillation. Most of the night was spent in the 12,000 to 15,000 foot region, from which the moon, Jupiter and Saturn appeared excellently defined through a 3.5 inch, 160 power telescope.

The gondola can probably be stabilized inexpensively, since its only noticeable motion was a rotation incurred by the distribution of large weights on long radii from a single, very flexible, line of support. On a flight scheduled for August 1958 apparatus developed by Dr. A. A. Hoag will be used to make quantitative photographic tests of seeing in the manner of those used for relocation of the Lund Observatory.

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Miller, Walter J. and Wachmann, Arthur A.
A new galactic Cepheid of unusually long period, VV 48.

Vatican Variable 48 is a galactic Cepheid whose period is $54^d.3313$. It is located in Vulpecula, at the southern tip of the Cygnus cloud, nearly 2° north of the galactic equator and about 2° southeast of β Cygni. Its exact position is $19^h31^m13^s.25$, $+26^\circ12'32''.7$ (1900.0). The photographic range of VV 48 is from 13.56 to 14.45 mag. On the basis of 314 Harvard, Vatican, Palomar and Hamburg Observatory plates, the light elements of VV 48 are:

$$\begin{aligned} \text{J.D. max.} &= 2433147.80 + 54^d.3313E. \\ &\pm .34 \quad \pm .0053 \end{aligned}$$

The early Harvard and recent Hamburg obser-

vations span an interval of over 20,000 days or 370 complete cycles.

The broad maximum or slight shoulder on the descending branch is characteristic of W Virginis stars or Population II Cepheids of comparable period. The blue and red Palomar Sky Survey plates, taken successively on the same night, show that VV 48 is only slightly reddened, and that there is a rich and very even concentration of stars in the field around VV 48. If a total photographic absorption of 1.0 mag. is assumed, the distance of VV 48 would be about 16,000 pc and its height above the galactic plane would be 500 pc. This variable is the galactic Cepheid of longest known period. We recommend VV 48 to the spectrographic observers, since spectral-type and radial-velocity determinations would be decisive in classifying the star and determining its real distance from us.

Identification charts, light curves and more detailed photometric data on VV 48 and on 11 other Cepheids will be published in *Ricerche Astronomiche* of the Vatican Observatory, 6.

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Observation of solar "points."

There is a type of object on the sun visible through a Lyot $H\alpha$ filter and photographed on hydrogen and calcium spectroheliograms that is the source of the spectroscopic feature called "hydrogen bombs" by Ellerman (1917) and "moustaches" by Severny (1956). These objects were observed through the filter by Lyot (1944) and called by him "points." We shall adopt his nomenclature because it indicates the small size and usually circular shape of the phenomenon. Points are identified by their characteristic spectrum, viz., brilliant emission streaks extending several angstroms on either or both sides of $H\alpha$ but not crossing it. Emission on the violet side is generally more intense than that on the red.

At the McMath-Hulbert Observatory points are observed by two methods. (1) They are seen visually in a Lyot- $H\alpha$ filter and then placed on the slit of the vacuum spectrograph for definitive identification and spectrographic study. (2) The points are recorded on series of 15 spectroheliograms made at different wave lengths, systematically spaced within $3\text{\AA}$ on either side of the center of $H\alpha$ or the K-line. Points are photographed with especial ease on K spectroheliograms.